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A Multi-Disciplinary Approach For Determining Adoption Of Agricultural Price Risk Management Strategies

Elizabeth Jackson¹, Mohammed Quaddus¹, Nazrul Islam², John Stanton^{1 & 2} and Zohurul
Hoque¹

¹ Graduate School of Business, Curtin University of Technology, GPO Box U1987, Perth, Western
Australia, 6845

elizabeth.jackson@postgrad.curtin.edu.au

² Department of Agriculture Western Australia, South Perth, Western Australia

Summary:

Australian wool producers have been slow to adopt price risk management strategies to stabilise the income from their wool sales. The highly volatile auction system accounts for 85% of raw wool sales while the remainder is sold by forward contract, futures and other hedging methods. An attempt is made herein to understand the behavioural factors associated with the slow adoption of modern commodity trading tools in rural Australian wool-producing farm businesses.

Consideration was initially given to prominent theoretical frameworks from the rural sociology research domain: Diffusion of Innovations, the Theory of Reasoned Action and the Theory of Planned Behaviour. While these are popular, time-tested theories of agribusiness and beyond, we needed to know if their constructs adequately capture all the dimensions of farm-level decision making.

Qualitative analysis was used to reveal behavioural factors associated with the adoption of price risk management strategies (specifically futures and forward contracts) for selling raw wool. Data from four focus groups conducted with wool producers in regional

Western Australia showed that complexity, risk, social participation, attitude towards the behaviour and perceived behavioural control were applicable for our research. However, the data also showed that trust, habit and social cohesion were additional behavioural determinants not identified in the rural sociological literature initially studied. A second review of literature from the social science, economics and marketing research domains showed there is now sufficient evidence to suggest that these new factors can be used to possibly strengthen traditional theoretical frameworks.

Therefore, the single message from this research is that any framework that is developed to model wool producers' adoption behaviours of price risk management strategies will most likely have improved reliability and validity with the addition of the constructs identified herein: trust, habit and social cohesion.

The significance of this paper lies in its multi-disciplinary approach to understanding the dimensions of farm-level decision making. The true validity of this significance will be tested in future stages of the research when a behavioural model is constructed and hypotheses are developed to test its internal relationships.

Keywords: Trust, habit, social cohesion, forward contracts, selling systems, focus groups.

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Introduction

An anomaly currently exists regarding the increased price volatility being experienced by Australian wool producers and the massive popularity of the auction system for selling raw wool. In 2006, the Australian Bureau of Agricultural and Resource Economics (ABARE) confirmed the forecasts of Kingwell (2000) that price volatility increased in the 2005-06 financial year while The Merino Company (2006) also concluded that the auction system is still the most preferred selling methods after more than eighty years in operation. Wool is an important contributor to the Australian economy however the limiting factors associated with price risk management strategies are not clearly understood.

Australia is the world's largest supplier of apparel wool (Lowe, 2005) and earned the nation approximately \$2.5 billion worth of export income in the 2005/06 financial year (Wood, 2006). Despite this, wool prices have been falling since the 1990s largely due to a decrease in global demand from the highly competitive price and manufacturing characteristics of substitute products, like cotton and synthetics (Perry, 2005; O'Donnell *et al*, 2005; Ashton, 2003). While China is a large and secure buyer of over half of Australia's wool (Bolt, 2006), its domestic demand for the commodity, which accounts for 65% of the Australian wool exported to this market, has been dropping (Perry, 2005; O'Donnell *et al*, 2005). Medium to long term forecasts for wool prices also reflect less than favourable outcomes with sheep numbers likely to increase as mixed grain/sheep producers re-stock their properties after the 2002/03 drought (Perry, 2005). While the national flock would have swelled, the extra wool produced will enter a market in which a lack of improvement in demand for wool, and hence suppressed prices, has been attributed to the predicted slow-down in the global economy and difficult economic conditions in Europe, the United States and Japan (Perry, 2005; The Woolmark Company, 2005). In essence, forecasts are for increased supply and suppressed demand.

This qualitative research explores the ideas, attitudes and knowledge of Western Australian wool producers on the current methods available for selling raw wool. The aim of the research is to explore perceptions and experiences of this group of primary producers. Wool producers from four regional locations in Western Australian were asked to discuss their views on selling wool as a vehicle to gather data for this qualitative research project. The findings and discussions from this research are grounded in this

preliminary data. Further research will use a quantitative research methodology to test the reliability and validity of the findings herein.

Background: Methods of selling raw wool in Australia

Research shows that Australian farmers are likely to experience greater fluctuations in commodity prices in the future (ABARE, 2006; Kingwell, 2000) yet some 85% still sell their wool on the open-cry auction system (Bolt, 2004). With only an additional 11% using the less risky forward market system (Coad, 2000), the remaining 4% use alternative systems such as futures trading or direct selling to processors. It has been suggested that the use of forward contract is one mechanism available to farmers to minimise the risk associated with selling agricultural commodities (Barnard & Nix, 1979) and thus to a more stabilised income. This section of our paper is dedicated to describing the various selling methods currently available to Australian wool producers.

Auction

The wool auction system has operated in Western Australia since December 1920 (“Flashback”, 2004) and is described on the Department of Agriculture and Food Western Australia’s (DAFWA) WoolDesk web site as follows: “Farm wool is mainly sold through open-cry auctions in Australia. These auctions are conducted by the Australian Wool Exchange (AWEX) on behalf of the Australian wool producers, the wool brokers and the buyers.”¹ Despite its seemingly long life, the Wool Industry Review Committee (1993) found that 31% of Australian wool producers are dissatisfied with this system and claim it is “defective due to volatility, [exposed to] possible manipulation, [has] unpredictable time constraints and an unnecessary intermediary participation in the communication channel” (p. 75). How did this view come about?

The Reserve Price Scheme that existed in the Australian wool selling industry until July 1991 held an enormous regulatory power over producers (Richardson, 2001). Its main aim was “to provide greater stability to wool prices at maximum sustainable levels” (Bardsley, 1994, p. 1092). However, this supply-driven scheme subjected the industry to interventionist pricing mechanisms that failed to provide adequate price and market

¹ http://www.agric.wa.gov.au/servlet/page?_pageid=213&_dad=portal30&_schema=PORTAL30

signals (Wool Industry Review Committee, 1993). There were numerous consequences of the Scheme's removal, one of which was the realisation of how dependent the industry had become on the auction system for selling wool. Stemming from this came the understanding of how the industry had basically become structured around this somewhat inflexible system (Wool Industry Review Committee, 1993). The industry found itself comfortable with the auction system, the point of rigidity, and unwittingly discouraged less risky, alternative selling systems to farmers (Wool Industry Review Committee, 1993; Musser, Patrick & Eckman, 1996).

Some thirteen years after the Reserve Price Scheme's demise and despite efforts to introduce electronic and other selling alternatives to the industry (Bolt, 2004; Liddle, 2004), about 85% of the Australian wool clip is still sold through open-cry auction (Bolt, 2004) with 15% being sold by alternative means. These alternatives are expanded upon later in the paper.

Interestingly, despite warnings of increasing commodity price fluctuations and encouragement for farmers to better manage their price risk (Barnard & Nix, 1979; Kingwell, 2000), the past fifteen years has seen the total percentage of the Australian wool clip being sold at auction increase from 80% (Piggot, 1990; Teasdale, 1991) to 85% (Bolt, 2004).

Forward contracting

The Wool Industry Review Committee (1993, p. 76) defines a forward contract as "A binding contract specifying the price (or price formula), quality and quantity of a product to be delivered at some specified date. The quantity may be expressed in units of output or as the production from a specified area. The contract usually specifies penalties to be exacted from each party for particular kinds of non-fulfilment." What can be gleaned from this definition is that no matter how one looks at forward contracts, such a selling mechanism is characterised by a set price and set delivery date for a specified commodity.

The principal benefits of forward contracts to farmers discussed in the literature are based on the concepts of price risk management/uncertainty and income stabilisation (Barnard & Nix, 1979; Miller, 1986; Musser, Patrick & Eckman, 1996; Fraser, 1997; McLeay & Zwart, 1998; Coad, 2000; Kingwell, 2000; Champion & Fearne, 2001; Bolt, 2004; Brakenridge, 2004; Cuming, 2004; Liddle, 2004).

Many authors discuss the risk-averse nature of farmers (Bond & Wonder, 1980; Pluske & Fraser, 1995; Coad, 2000; Pannell, Malcolm & Kingwell, 2000) and comment on the

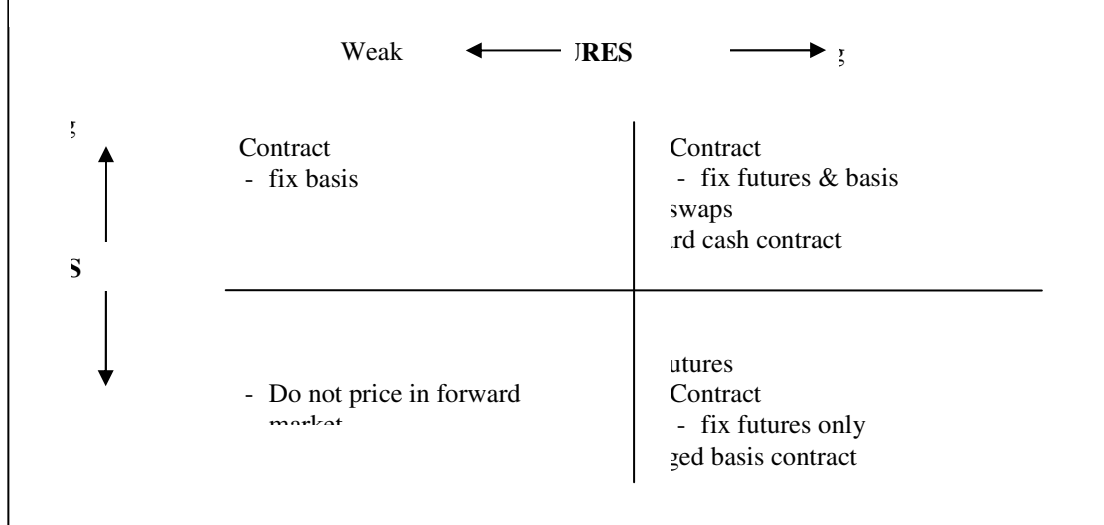
benefit of forward contracts in terms of their stabilisation on income. Barnard and Nix (1979) give us a British agribusiness definition of forward contracts and aptly describe them as a tool of turning price uncertainty into price certainty.

Futures

Futures contracts have been available for trading wool in Australia on the Sydney Futures Exchange since the early 1960s (Mitchell, 2003) and popularity peaked in 1973 when turnover of contracts averaged 15,500 lots per month (Goss & Avsar, 1992). Research cited by Kingwell (2000) showed that only 4% of Australian farmers are utilising the futures market to trade their wool; but this had increased to 10% by 2004 which equated to about 3 – 5% of the national wool clip (Cuming, 2004). The poor adoption rate of wool futures has been attributed to the price stability offered by the Reserve Price Scheme and the price gap that exists between futures and auction (Teasdale, 1991; Mitchell, 2003). This low adoption rate has also been attributed to the perception that futures do not offer any additional financial returns or price premiums, there is a lack of availability, there is a lack of confidence with them as a selling system and there is a lack of understanding on how they operate as a selling system (The Merino Company, 2006).

Despite its poor adoption rate, the wool futures market in Australia operates as follows. Trading of futures must be conducted through a broker and is mostly carried out via the internet whereby traders access the Sydney Futures Exchange web site via their broker's web site (Mitchell, 2003). The range of futures products available in the Australian agricultural industry and how they can be optimised can be presented diagrammatically in Figure 4 (Koch, 2006, p. 54):

Figure 4: The range of futures products available in the Australian agricultural industry



Both the futures market and forward contracts provide a similar opportunity for traders in stabilising the price volatility of the auction system in terms of setting price and commodity delivery details for a date in the future (The Merino Company, 2006; Koch, 2006; Teasdale, 1991; Mitchell, 2003; Cuming, 2004). The key defining element of futures contracts that separate them from forward contracts is that futures contracts are standardised to operate through the Sydney Futures Exchange so are more complex than an agreement between a farmer and wool buyer. This standardisation allows for reductions in the costs of negotiating futures contracts as the terms and quality limits are set by the Exchange (Lubulwa *et al*, 1997).

The benefit of futures, as with forward contracts, is that they are a method of managing price risk (Mitchell, 2003) however the futures market also provides wool buyers with a forum to offset the price risks associated with taking out forward contracts with producers (Lubulwa *et al*, 1997). This was the greatest disadvantage of Macquarie Bank's withdrawal from the wool futures market as it meant that Australia's forty registered wool traders (Champion & Fearn, 2001) lost one of the strongest agents for securing their business' against the risk of significant market price movements (Cuming, 2004).

A further characteristic which futures and forward contracts share is the cost they incur by offsetting price risk. It has been said that producers cannot expect to be paid the premiums offered at the auction as forward contracts required buyers to carry a degree of risk (Seale, 1996; Teasdale, 1991; Lubulwa *et al*, 1997); this holds true for futures contracts as well. In fact Cuming (2004) reports that the difference between an auction and futures price can be as much as 200 ¢/kg.

Other available selling systems

Systems other than selling via auction or forward contract are utilised by 4% of Australian wool producers. Such systems include, but are not limited to: retained ownership programs, sale by tender, offer boards, tops auction, laser matched interlots, premier wool Newcastle and electronic selling (including Wooltrade Australia Pty Ltd or e-wool™) (see www.elders.com.au, www.landmark.com.au and www.sfe.com.au).

Research method and design

Due to the exploratory nature of this research, no attempt is made to present results of the vast empirical findings of theoretical frameworks however we take heed of the suggestions of Glaser (1992). This author advocates that an initial literature review is useful for informing the researcher in conservations related to relevant theories but only provides a sufficient awareness so not to impose any biases on the findings.

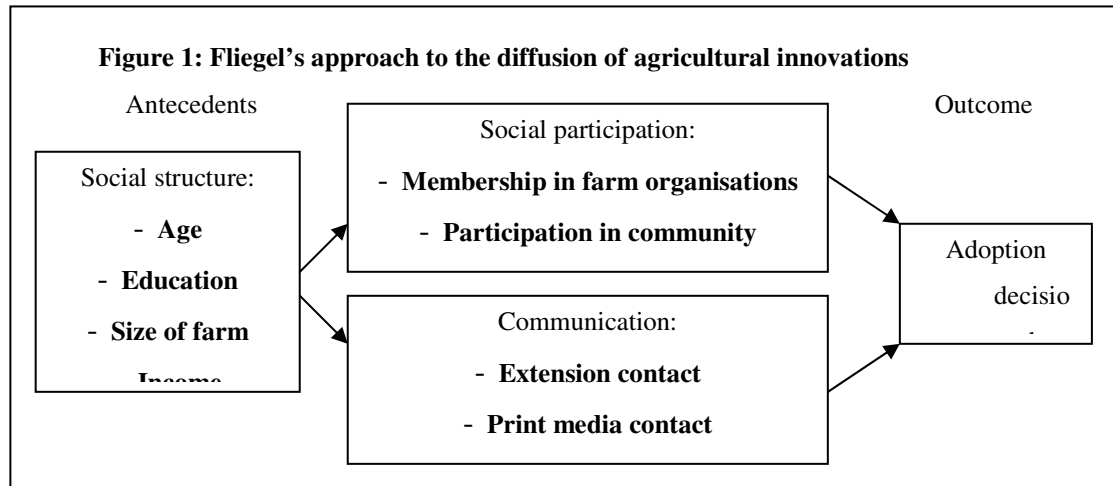
Previous theoretical approaches

In order to answer the aforementioned research question, clarity must be sought on the dominant adoption factors for wool producers choosing a selling method – specifically focusing on farmer behaviour. At present, much literature exists surrounding the methods of price risk management that are available and the behavioural determinants of why farmers undertake specific farming practices. Details of price risk management strategies for wool selling were detailed in the previous section, now we explore theoretical approaches to adoption.

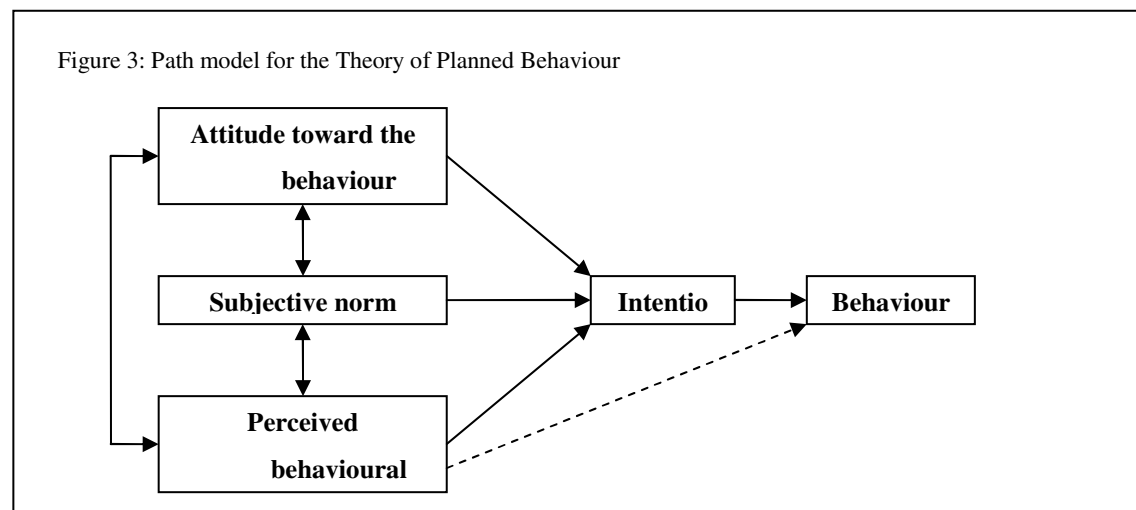
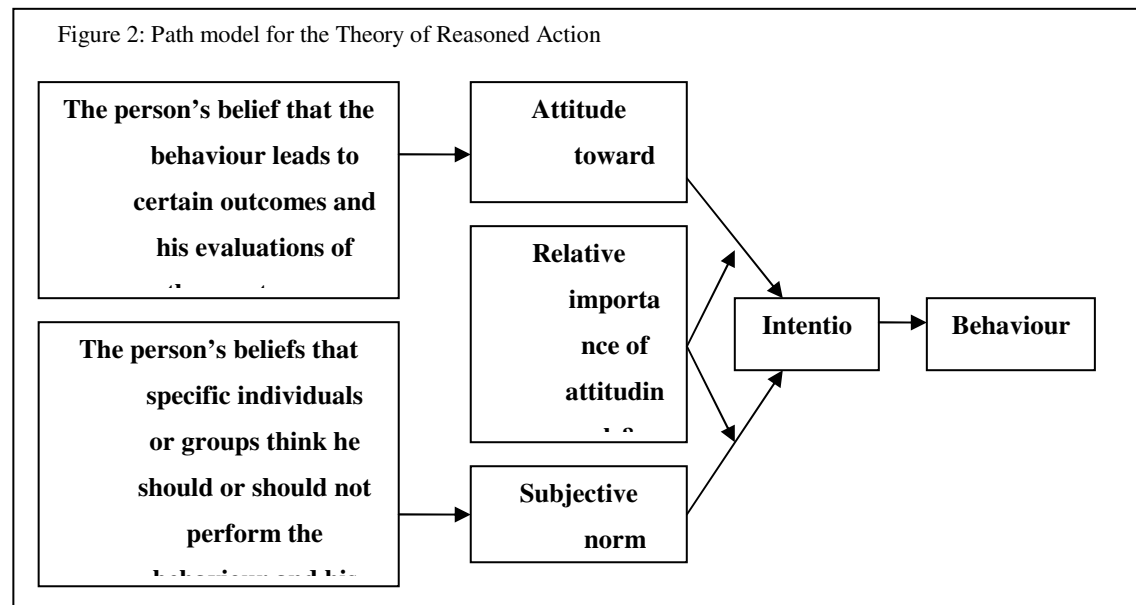
In terms of the behavioural determinants associated with adoption, much literature exists on the Diffusion of Innovations in agriculture. Diffusion is defined by Rogers (1995, p. 5) as “the process by which an innovation is communicated through certain channels over time among members of a social system.” Interestingly, agriculture is the dominant research domain within the Diffusion of Innovations sphere of knowledge. In a survey of nearly 4,000 publications on Diffusion of Innovations, Rogers (1995) found that studies from the rural sociology research domain provided the greatest contribution to this theory. There were 845 rural sociology publications with the next largest contributor being the field of marketing and management with 585 publications.

The present research seeks to ascertain, by qualitative methodology, if factors from dominant behavioural theories are applicable to the adoption of price risk management strategies for wool producers. Given the prominence of Diffusion of Innovations within rural sociology, constructs from this framework may be applicable. Rogers nominates these

key constructs as: relative advantage, complexity, compatibility, risk, trialability and applicability. It is also likely that constructs from Fliegel's (1993) interpretation of the Diffusion of Innovations will also appear: social structure, social participation and communication (as shown in Figure 1).



Other behavioural theories that have been used to explain farmer behaviour are the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB). These theories use various constructs to determine intention to perform a specific behaviour and then form a correlation between intention and actual performance of the behaviour in question. The TRA (Figure 2) posits that intention is the mediating variable between attitude and subjective norm to predict any given behaviour of an individual (Fishbein & Ajzen, 1975). The TPB is a development of the TRA as it includes perceived behavioural control for measuring the extent to which an individual believes the outcomes of a behaviour can be controlled (Burton, 2004); as shown in Figure 3.



An important finding of empirical applications of the TPB is its ability to be extended. Since the TPB was first published (by Ajzen in 1985), research has been conducted to show that, not only are there significant relationships between the theory's constructs, but that it is possible to add non-traditional constructs to the theory's framework. Ajzen (1991) had the foresight to predict that this would be the case and, more than ten years later, Burton (2004) cites studies that have successfully integrated additional factors to the TPB on an "as needed" basis. Such factors were listed as habit, moral obligation and self-identity although it was only the construct of identity that Burton (2004) nominates worth using in farming-based social psychology research. In addition to Burton's findings, other constructs worth considering for extension of the TPB include past behaviour (Bagozzi & Kimmel, 1995; East, 1993), environmental factors (Corral, 2002), goals and communication (Tutkun & Lehmann, 2006; Tutkun, Lehmann & Schmidt, 2006).

Key findings from previous approaches

The purpose of this literature review was not to cite numerous empirical applications of these prominent behavioural theories but to familiarise us with likely behavioural factors of adoption that will be raised in the data. Figures 1, 2 and 3 were presented to succinctly illustrate the constructs of common behavioural theories. A summary of these constructs is shown in Table 1 and it is hypothesised that each of these will be identified when determining the adoption of price risk management strategies for selling raw wool in Australia.

Table 1: Key constructs from dominant behavioural theories within the rural sociology research domain.

Diffusion of Innovations

Relative advantage
Complexity
Compatibility
Triability
Risk
Applicability
Social structure
Communication networks
Social participation

Theory of Planned Behaviour

Attitude towards the behaviour
Subjective norm
Perceived behavioural control
Intention

Research question

The present study is the qualitative, exploratory phase of a larger, quantitative study.

Qualitative research was used in this initial phase of the research as a theory-building strategy, as suggested by Yin (2003), Morse and Richards (2002) and Hamel (1991). The ideas, attitudes and knowledge of wool producers were gathered to see if an existing behavioural theory was an adequate framework for the further research, or if a new theory needed to be developed. The research question related to this particular paper is: Are there any non-traditional behavioural factors that need to be incorporated into existing frameworks to determine adoption of price risk management strategies for selling raw wool?

So far, three prominent behavioural theories have been considered but it needs to be determined if the daily realities of Australian wool producers can add to these.

Data collection

Selecting participants on the basis of convenience is often used for business research (Zikmund, 2003) and was used herein to select locations and participants for the focus groups. Regionally-located DAFWA officers provided lists of local farmers who would be potentially interested in participating. The principal selection criterion was that participants had to have experience in selling wool within Australia. Potential

participants were contacted by telephone, fax and e-mail. Focus groups were conducted in areas of varying wool production in Western Australia (Northampton, Merredin, Kojonup and Esperance) with participant numbers ranging from two to eight people. Information was collected during the focus groups using Curtin University's Mobile Group Support System (MGSS) and AnyZing 5.0. Zing Technology allows focus group participants to electronically record their responses in anonymous "play spaces", these are projected onto a central video screen for further discussion (www.anyzing.com). All participants contributed to these focus groups voluntarily.

Focus groups are characterised as being unstructured and allow for spontaneous and free-flowing dialogue amongst participants (Sekaran, 2003; Zikmund, 2003). The nature of this research was to explore the ideas, attitudes and knowledge of wool producers, therefore it was important that as many ideas flow as freely as possible and take advantage of participants' interactions – this being the reason why focus groups were chosen as the data collection method as opposed to face-to-face interviews. This group dynamism allows for issues to be brainstormed and participants to draw ideas from one another and is considered the hallmark of focus groups (Berg, 2001).

Wilkinson (2004) states that focus groups provide the opportunity for people to interact with each. In order to encourage this fluid process, she states that facilitators must present discussions rather than ask questions of participants. It is for this reason that three, fictional, loosely-structured scenarios were used as the primary vehicle to collect data. The principle use of these scenarios was to conduct a generalised, but not necessarily representative, situational analysis of the ideas, attitudes and knowledge of Western Australian farmers so factors could be identified for theory-building. Prior to conducting the focus groups, a pilot session was run with four members of the research team and an external facilitator.

At the beginning of each focus group, the facilitator gave participants a demonstration of the MGSS technology and took them through an ice-breaker session to familiarise them with the MGSS key boards. Immediately following this, the scenarios commenced as follows:

Introductory script: Bob Smith, formerly from the north-eastern Wheat-belt, has recently bought a property next door to you. While he has extensive farming experience, he has no idea about farming sheep so he asks for your advice.

Scenario 1: What advice would you give Bob with respect to selling his wool?

Scenario 2: What other ways are there to sell wool in Australia?

Gap script: Bob has been talking to a mate from over east who has told him that forward contracting is a good way to sell wool.

Scenario 3a: As far as you are concerned, what are the advantages for Bob?

Scenario 3b: As far as you are concerned, what are the disadvantages for Bob?

Scenario 3c: Given what you have heard so far, how would Bob know if he's better off?

Upon the completion of each scenario, participants were asked to type their ideas into their anonymous "play space" and press F9 to record their input. Participants who did not feel confident in typing their thoughts were provided with assistance from the research team. This method proved to work efficiently except in cases where participants did not feel confident to ask for typing assistance. Probing of ideas was provided by all members of the research team.

Each focus group ran for about two and a half hours with participants being provided with a copy of the raw data collected in the form of a print-out from the MGSS as a record of the activity.

Data analysis

A range of techniques are suggested by authors, such as Miles and Huberman (1994), that will assist with the challenging task of analysing qualitative data. Given the objectives of the research and its exploratory, rather than confirmatory, nature, content analysis was the preferred technique for analysing the raw data collected from the focus groups. Content analysis involves the examination of data in a systematic and replicable fashion (Riffe, Lacy & Fico, 1998; Wilkinson, 2004). It requires transcripts of raw, qualitative data to be systematically trawled for recurrent themes (themes listed in Table 1). Each theme is then counted throughout the transcripts for its replication within the data thus introducing a quantitative element to the research. In the case of this research, the themes identified during data analysis are later used as theoretical constructs.

Discussion of results

Data from the scenarios revealed that participants believe there to be several methods available to them for selling their wool. This section of the paper presents findings of the focus groups starting from the most popular selling method and ending with the least popular. Behavioural factors associated with each method are highlighted respectively.

The most common advice on how to sell wool was to find a broker. All focus groups concluded that a broker can provide a simple, “whole farm package” service of managing all commercial aspects of the farm business, such as wool sales, fertiliser and chemical purchases, agronomic advice, livestock trading, land sales and providing general farm supplies. One of the main issues that was raised when discussing the use of a broker to sell wool was the importance of friendliness and trustworthiness in the relationship. For example, it was said “Get a broker [who] you get along with/is friendly”, “It’s important to get along with the broker and for him to be friendly” and “Broker needs to be honest”. These issues were pivotal in farmers not wanting to use more sophisticated systems such as futures and options contracts, and not switching between brokerage firms.

Not surprisingly, associated with the issue of finding a broker was sending raw wool to auction. In most cases it was assumed that a broker will advise for wool to be auctioned however the comment was made that brokers will provide the services of a “Portfolio Manager” who is more likely provide advice to sell wool by other means.

As found in the literature, it was said that the auction system is “a good place to start” when selling wool for the first time and that it “is the dominant system” for selling wool in Australia. Participants agreed that the auction price is the principal benchmark used for setting the reserve price when selling or negotiating. There was no mention of distinguishing whether the auction system or the use of a broker yield the most financial gain.

Merchants were described as specialised wool marketing organisations, such as Primaries or West Coast Wools, providing a slightly more specialised marketing service to their clients. While they were seen not to offer a “whole farm package”, like the brokering agencies, they seem to be associated with a more intimate knowledge of the industry and an historical link with their clients. Trustworthiness and friendless were also important factors associated with the use of merchants.

Using futures and options to sell wool was mentioned during three out of the four focus groups however it was not recommended as a “user-friendly” method (“The futures market isn’t producer-friendly”). Only one participant from all the focus groups claimed to have used the system and also stated that he would not use it again. This system was described as “having to be studied”, “unfriendly”, complex and costly (in terms of advice required). It was said to be a waste of time because the wool reverts to auction once traded and the futures trade in Australia is too limited to make it a worthwhile selling option.

Strategies were discussed that related to by-passing the auction system. This was principally due to the auction's price volatility. The focus group participants from Esperance described selling raw wool direct to mills (in a co-operative sense) in great detail. Participants of other focus groups said that they had heard of this system in operation but had never heard of any associated success. The main objective of adopting this system is to by-pass the auction system and brokering companies due to users' discontent with these dominant systems. The discontent was borne from a lack of trust and a sense frustration with volatile pricing.

Another selling system that was discussed was that of forward contracts, sometimes referred to during the focus groups as "private selling", "selling on-farm" or "selling off the sheep's back". This practice was only raised during two of the four focus groups with many participants not having a full understanding of how this system operates. It was quite often confused with futures trading.

Upon prompting this issue, there was general agreement that the main advantages of forward contracts were in terms of price risk management and improved financial planning. However, it was the concept of "not locking in a good price" (compared to the auction price on the day of the contract's closure) that was the key determinant for this system's lack of use. There was also the fear of not being able to fulfil the requirements of the contract in terms of quality or quantity. This issue was described as a more common problem with forward contracts for grain sales and was suggested to be an insignificant issue if the producer is adequately familiar with the farm's flock and historic wool quality data.

Similarly, selling raw wool on the internet or electronic selling (via systems such as Wooltrade Australia Pty Ltd and e-wool™) was only mentioned during two of the four focus groups but prompting of this issue revealed it to be a very popular system described as convenient and simple. Upon discussion of this issue, the focus groups were actually used by participants as an education forum as many producers were not familiar with the system, although were keen to try it upon advice from their peers.

Value-added sales, described as selling processed wool to international cloth-makers, was once again a strategy used to by-pass the auction system and brokering companies from the supply chain. This method was only discussed during one focus group. Prompting of this issue during other focus groups did not yield any discussion of relevance.

Constructs consistent with previous findings

Having found the opinions of wool producers about available selling systems, this data can now be compared with knowledge of prominent adoption theories. Many of the key constructs from prominent behavioural theories have been found to be important determinants of adopting price risk management strategies for selling raw wool. Table 2 shows the traditional constructs that were shown in Table 1 but it is now more clear which of these are more applicable to the behaviours of wool producers. It can be seen that, of the thirteen themes that were thought to be important, only five can be considered appropriate to the behaviours of wool producers: complexity of the selling strategy, risk associated with the strategy, the social participation surrounding the selling transaction, the attitude towards the selling method and the perceived control associated with the selling method.

Focus group participants were very clear that they were not interested in the complexity associated with using forward contracts or futures. They also said that they were very satisfied with the simplicity provided by the services of a wool broker who can sell wool using a specified reserve price at auction as well as providing a range of other products and services for the farm business.

Table 2: Key constructs from dominant behavioural theories within the rural sociology research domain.

Diffusion of Innovations	Relevant?	Theory of Planned Behaviour	Relevant?
Relative advantage		Attitude towards the behaviour	ü
Complexity	ü	Subjective norm	
Compatibility		Perceived behavioural control	ü
Trialability		Intention	
Risk	ü		
Applicability			
Social structure			
Communication networks			
Social participation	ü		

While many of the focus group participants tried other methods in order to by-pass the auction system, due its volatile prices, the threat of “locking in” an unfavourable price seemed to dominate as a disadvantage for any sort of forward selling. It was implied that wool producers perceived price risk management strategies as highly risky because a higher price might be achieved at auction on the closing date of the contract.

Social participation was another important issue. Traditional price risk management strategies were not favoured due to the lack of social participation involved with their transaction. Participants said that selling their wool by futures and forward contract was unfriendly and impersonal which was highlighted by discussions on the importance of a good working relationship with wool brokers.

Positive attitudes towards the behaviour of adopting a price risk management strategy were hindered by the dominance of the auction system and the relationship held between producer-and-broker or producer-and-merchant. It was implied that brokers and merchants are dominated by the auction system and offer this as their preferred selling method (“There’s no advantage in by-passing the auction system because bales end up there eventually anyway”, “Auction price/system is the benchmark for everything that goes on”). Another issue surrounding attitude toward behaviour was that even participants who make attempts to by-pass the auction system still use this selling method due to its dominance and simplicity.

The dominance of the auction system was the primary reason limiting participants’ control of their desire to adopt the use of forward contract or futures. There was said to be sufficient information available on these method but participants’ lack of familiarity with these methods kept them from diversifying the way they sell their wool.

The factors outlined in Table 2 have now been addressed but there are important factors that were raised in the focus groups that still require exploration.

Constructs not consistent with previous findings

Continual interaction with the data revealed three new behavioural factors that were not considered in the initial literature review:

Trust: trustworthiness of the broker or merchant selling the wool and trust of the auction system to provide a better price than could have been previously “locked in”.

Habit: wool producers are in the habit of using the auction system due to its familiarity and traditional dominance as a selling method.

Social cohesion: it appears that wool producers, brokers and merchants are caught in the mainstream processes and mechanisms of selling wool by auction so are not confident to adopt any other selling methods.

The results of this research have found that not all the factors from traditional behavioural theories used in the rural sociology research domain are applicable to understanding the price risk management behaviours of wool producers. The focus groups revealed that five factors are highly applicable (complexity, risk, social participation, attitude toward the behaviour and perceived behavioural control) while there were a further three that were not addressed by the theoretical frameworks considered. It is now pertinent to consider current knowledge on these factors to justify their addition to traditional theoretical frameworks.

Trust

Barney and Hansen (1994) develop the following definition of trust from a literature review on trust and trustworthiness: “Trust is the mutual confidence that no party to an exchange will exploit another’s vulnerabilities” (p. 176). It is important to note that this definition posits that trust is an attribute between parties however the present research relies more on the definition of trustworthiness as the consideration is only from wool producers’ view point. Barney and Hansen accommodate this view point by stating that trustworthiness is a characteristic of an individual exchange partner. Despite the clarity of this definition, the complexity of trust in commercial relationships cannot be underestimated (Fritz & Hausen, 2006). Hardaker, Huirne, Anderson and Lien (2004, p. 6) go so far as to list relationship risk in agriculture (“...risks inherent in the dealings between business partners and other trading organisations.”) with matters as important as production risks and market risks.

When discussing each of the wool selling methods with focus group participants, an overwhelming majority said that a broker is the best place to start and was by far the most preferred option. Upon further questioning about the services provided by brokers, interesting views were revealed about the importance of the relationship held with this type of service provider. It appears that the auction is so dominant, not only because it is the most simple selling method to understand, but because “there’s a lot of infrastructure tied up with the auction system that’s been there for years”. As a consequence, producers do not appear to have trust in brokers to advise them of any selling methods other than auction. This was made apparent by comments such as: “Local brokers don’t have the sort of knowledge about ... the market to give good advise”, “Not even brokers have enough knowledge of the systems available”, “Really [no alternatives were] left after all the brokers went broke after offering prices too high for forward contracts” and “Don’t trust anyone”.

It can thus be concluded that while the service brokers offer is widely accepted, there are some underlying issues with this service that are inhibiting the adoption of alternative price risk management strategies.

In terms of the literature, the concept of trust is a widely researched issue in the field of marketing, particularly when it comes to the establishment of relationships (see Selnes 1998 for an extensive list of citations). It is even considered an economic asset by Wilson and Kennedy (1999). However it is not a construct of either TPB or Diffusion models, although it needs to be said that Selnes (1998) found there to be a highly

significant relationship between communication (a key construct of Diffusion) and trust when considering satisfaction in buyer-seller relationships. But the most relevant finding from Selnes' study was the importance of sellers and service providers "communicating all relevant information without disguising potential unfavourable data" (p. 319). This closely supports the comments of the focus group participants that trust is lacking in brokers' ability to provide a complete range of information about price risk management strategies.

Lorenz (1999) is another author whose work is important in justifying the place of trust in the relationship between wool producers and brokers; with particular consideration to the comment made about wool buyers going broke. Lorenz pointed out that because standard economic theory is based on the assumption that people are all rational decision makers, it largely omits social aspects of trust, friendliness and loyalty. This author goes to great lengths to conclude that if mistrust plays a role in the relationship between actor and agent then it is highly unlikely that the actor will be willing to undertake any sort of long term contractual relationship with the agent. This finding is supported by the work of Zak and Knack (2001) who found that commercial environments which operate at low levels of trust are likely to have reduced rates of investment. Further supporting evidence is provided by Murray-Prior and Wright (2004) who researched the use of strategies and decision rules by Australian wool producers to manage uncertainty. These authors found that wool producers perceived that selling methods alternative to auction were more risky due to "the risk of being taken advantage of, or not being paid" (p. 63).

Lorenz's (1999) suggested way to solve this problem is for agents to encourage trust by at first offering contracts of low risk (being small quantities of wool in this case). Larger contracts can subsequently be offered as trust and confidence is developed in the relationship.

The conclusion that can be drawn from this section is that while the use of brokers are the dominant service providers for selling raw wool, they must work hard to develop relationships based on trust if price risk strategies are going to be adopted by wool producers. The focus groups showed that there is an element of mistrust that exists when wool producers are seeking advice about price risk management strategies which the literature has shown to be a valid concern.

Habit

While this section is titled “Habit” it also includes the importance of tradition in farmer decision making. Salamon, Farnsworth, Bullock and Yusuf (1997) discuss the importance of traditions and family influences on decision making. This finding led to a search of literature that yielded an enormous knowledge base about the importance of family influence on the farm business (see Hildenbrand & Hennon, 2005; Albrecht & Albrecht, 1996; Carlson & Dillman, 1983; Gasson, 1973; Gasson & Errington, 1993; Machum, 2005; Herrmann & Uttitz, 1990; Pennings & Leuthold, 2000; Wilkening & Guerrero, 1969; Wilkening & Bharadwaj, 1968). The research on family association with farmer decision making is principally from the field of sociology; material from the field of agribusiness has been found to be more relevant to this research.

From the field of agribusiness, the importance of tradition was also highlighted by McLeay and Zwart (1998). These authors found that traditional commodities in farm business systems were associated with high production levels and high familiarity with marketing systems. As a consequence, traditional commodities required less human capital so producers showed highly significant tendencies to using market or cash sales.

Now focusing on the concept of habits. A definition is cited by Hodgson (1997, p. 664); it is said that habit is “a more or less self-actualising disposition or tendency to engage in a previously adopted or acquired form of action”. This author compares habits to rules in that habitual actions are more subconscious, unexamined and “may become engrained even if they are disadvantageous” (p. 665). Hodgson also lists seven instances that are believed to call for the establishment of an habitual behaviour: optimisation, extensiveness, complexity, uncertainty, cognition, learning and communication. Two of these are clearly presented in the Diffusions of Innovation model: complexity and communication. It can also be argued that Hodgson’s uncertainty factor are closely linked to Rogers’ risk factor as both are associated with levels of available information and the probabilities of future events.

In terms of the findings of this research, it can be said that four of Hodgson’s factors are important from the focus group data: extensiveness, complexity, uncertainty and communication. It is pertinent to compare Hodgson’s definitions of these four factors with the results of the focus groups.

Extensiveness: where the information may be readily accessible and comprehensible but the search for it requires the application of substantial time and resources (p. 665). The issues related to the amount of information required to make informed decisions on

futures and forward contracts was raised in the focus groups. It was said that these methods involved too much paper work and fine print. It was also said that wool futures trading “had to be studied”.

Complexity: where there is a gap between the complexity of the decision environment and the analytical and computational capacity of the agent (p. 665). This factor was nominated as being a major disadvantage of using forward contracts and futures to sell wool due to the amount of paper work and fine-print involved in using these methods. They were discounted principally due to the simplicity of the alternative auction system.

Uncertainty: where crucial information and probabilities in regard to future events are essentially unobtainable (p. 665). It was acknowledged on numerous occasions that the auction system is highly volatile in terms of pricing however, this uncertainty was greatly overshadowed by the uncertainty of “locking in an unfavourable price”. Other aspects that were discussed by participants included the uncertainty of the value of their wool, the uncertainty associated with finding a “spike” in the market, the uncertainty of weather conditions and the associated effects on production levels, the uncertainty of being unable to lock-in a profitable price and the uncertainty of not being able to supply the contracted quality or quantity.

Communication: the general need to communicate regularly with others (p. 665). The importance of communication was highlighted in discussions about the relationship held between the producer and wool broker or merchant. Trust and honesty were pivotal to a good working relationship – two aspects that stimulate open lines of communication.

Social cohesion

Social cohesion is defined by Peterson and Hughey (2004, p. 533) as “a construct that considers participation in the context of relational notions such as trust, shared emotional commitment and reciprocity among community members”. A review of literature on social cohesion showed that it can also be described as the solidarity felt by societies under various social or economic pressures. For example, Kawachi and Kennedy (1997) cite literature that showed improvements in social solidarity, social cohesion and life expectancy as results of narrowed income differentials in war-time Britain. Another example is work by Vison (2004) who cites research which addresses the question of the influence of social cohesion between Australian suburbs with high and low crime levels.

This relates to the findings of the present paper in that as earning conditions become more difficult for wool producers (that is, prices decrease and become more volatile), it is likely that producers, brokers and merchants will draw together and stick to what they know best – the auction system. It is believed that the dominance of the auction system has a shared emotional commitment among wool producers because of its familiarity and its provision of social order and social connectedness, important criteria outlined by Turok *et al* (2004). The auction system also provides reciprocity among community members in the form of a common language for buyers and sellers as it provides the perceived benchmark wool price – an additional example of social order and social connectedness. There is strong evidence in the data to support this: “Auction price is the benchmark for knowing when you’ve had a win”, “Auction price/system is the benchmark for everything that goes on”, “Forward contract prices are based on auction prices so you may as well just use the auction system to save paper work and being ripped off”, “There are no other ways to sell wool outside the auction system”, “It’s a matter of counting the dollars over the day’s auction price”, “the daily auction price is a fairly good indicator of what’s happening on the day in terms of price”, “Compare [forward contract prices] with the auction” Focus group participants continually stated that the auction system provides the decision-making basis of when and how to sell wool. The auction price is considered the industry benchmark and major source of price discovery for all actors within the industry.

Review of the data has therefore revealed three key behavioural factors that are not considered in predominant adoption theories: trust, habit and social cohesion. A review of the literature on these factors shows that they are common factors in the economics and marketing research domains which adds a multi-disciplinary element to this paper. The conclusion is that these three behavioural factors from various research domains are likely to be solid additions to a new theory on the adoption of risk management strategies for selling raw wool.

Concluding remarks

It was initially thought that traditional behavioural determinants of price risk management strategy adoption for selling raw wool would be easily foreseen in focus groups addressing the research question herein. This was absolutely not the case. It was thought that constructs from TPB and Diffusion of Innovations would be identified in transcripts from focus groups, instead there turned out to be additional issues for consideration: trust, habit and social cohesion. A second literature review showed there

is now sufficient evidence to suggest that these new factors can be used to possibly bolster the strength of the traditional theoretical frameworks.

This research provides an important opening into new ways of understanding farmer behaviour that draws from the social science, economics and marketing research domains. It has shown that traditional theoretical frameworks associated with the adoption of farm business management practices may not adequately account for all dimensions of farm-level decision making. Therefore, the single message from this research is that a framework developed to model wool producers' adoption behaviours of price risk management strategies will most likely have improved reliability and validity with the addition of the constructs identified herein: trust, habit and social cohesion.

The next step in the process of this research is to create such a behavioural model. In so doing, a range of hypotheses will be developed and tested using a quantitative methodology.

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